Congenital Cardiology Solutions

VASOACTIVE INOTROPIC SCORE (VIS) IS ASSOCIATED WITH OUTCOME AFTER INFANT CARDIAC SURGERY: A REPORT OF THE PEDIATRIC CARDIAC CRITICAL CARE CONSORTIUM (PC4)

Oral Contributions
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Background: Few empirically-derived markers of illness severity exist for pediatric cardiac surgical patients. Vasoactive-inotropic score (VIS), a measure of post-operative cardiovascular support, has been associated with morbidity and mortality after infant cardiac surgery in prior single center studies. We evaluated whether this held true in a multi-institutional prospective cohort.

Methods: Consecutive infants (≤1 yr) undergoing cardiac surgery with bypass were enrolled at 4 centers. Doses of vasoactive infusions were recorded for 48 hrs after surgery, converted to integers, and summed to generate hourly VIS. The optimal definition of "high VIS" was determined empirically to be maximum VIS ≥15 in the first 24 hrs. A dichotomous primary outcome was defined a priori as a composite of: hospital or 30-day mortality, cardiac arrest, mechanical circulatory support, dialysis, or neurologic injury. Secondary outcomes included duration of mechanical ventilation and intensive care (ICU) length of stay (LOS). Multivariable logistic regression adjusting for patient factors, operative characteristics, and center effects was performed to test the association between VIS and outcome.

Results: Overall, 391 infants were enrolled including 141 (36%) neonates and 130 (33%) with high VIS. Forty-five (12%) reached the composite endpoint including 19 (5%) deaths. High VIS was independently associated with the composite endpoint [adjusted odds ratio (AOR) 4.0, 95% confidence interval (CI) 1.8-8.9]. This relationship was consistent across age groups and levels of surgical complexity in stratified analyses. High VIS was also independently associated with mortality (AOR 4.7, 95% CI 1.4-15.8) and each of the individual morbidities. Patients with high VIS had greater odds of prolonged mechanical ventilation (AOR 4.3, 95% CI 2.3-8.0) and ICU LOS (AOR 3.2, 95% CI 1.8-5.9).

Conclusions: In this multi-institutional study, VIS was independently associated with mortality and morbidity in infants undergoing cardiac surgery with bypass. We have defined a robust, generalizable metric of cardiovascular support in this population that performs well as a marker of illness severity across centers.